When we think about cardiovascular catastrophes, heart attack and stroke leap to mind. We’re less likely to think of heart failure, though it affects more than 2.5 million women and is the leading reason for hospitalization and a major cause of death in women over 65. The term “heart failure” evokes an image of a suddenly silent heart, but the condition is better described as a gradual decline in the heart’s ability to pump and circulate blood.

Like other muscles in the body, the heart weakens over the years. For most people, the effects are subtle: color fades from the cheeks; hands grow cold; you begin to nod off earlier in the evening. But for the 1% of people over 65 who develop heart failure, a decline in the supply of oxygenated blood to organs and tissues can eventually jeopardize the lungs, kidneys, and liver.

Today, we know that practicing healthful habits earlier in life can often prevent heart failure. And thanks to improved treatments aimed at preserving heart function, women with heart failure can expect to survive longer than in past generations.

Causes of heart failure
Heart failure usually doesn’t have a single cause; instead, several factors or conditions act in concert to erode heart function. The problem may originate in either the right ventricle, which pumps blood into the lungs, where it picks up oxygen, or the left ventricle, which pumps oxygen-rich blood to the body’s tissues. In either case, the heart can’t do the work needed to supply adequate blood to all parts of the body. The ventricle may be too stiff to relax enough between contractions and thus unable to fill completely (diastolic failure), or—more commonly—it may not contract strongly enough to expel most of the blood it holds (systolic failure).

Like coronary artery disease, heart failure may take a slightly different course in women than in men. The landmark Framingham Heart Study has followed the development of heart failure in three generations of men and women and catalogued the risk factors. The researchers found that any of the conditions listed below can set the stage for heart failure, but some are more likely culprits in women:

- **Coronary artery disease (CAD).** As blood vessels narrow because of cholesterol buildup, blood flow to the myocardium (heart muscle tissue) decreases, gradually causing the tissue to deteriorate. CAD is a major source of heart failure, but it’s less likely to be the chief cause in women than in men.

- **Hypertension.** As blood pressure increases, the heart has to work harder, putting its muscle tissue under strain. Hypertension raises the risk of heart failure two to three times, and it’s a stronger risk factor in women than in men. In a 1996 Framingham report, nearly 60% of women with heart failure had a history of high blood pressure, compared with only 40% of men.

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**Vitamin D status by blood levels of 25(OH)D**

<table>
<thead>
<tr>
<th>Vitamin D status</th>
<th>25(OH)D in nanograms per milliliter (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient</td>
<td>Less than 20 ng/mL</td>
</tr>
<tr>
<td>Insufficient</td>
<td>20 to 29 ng/mL</td>
</tr>
<tr>
<td>Sufficient</td>
<td>30 ng/mL or more</td>
</tr>
<tr>
<td>Potentially harmful</td>
<td>More than 150 ng/mL</td>
</tr>
</tbody>
</table>

*25-hydroxyvitamin D₃ (vitamin D precursor)*

Diabetes. Diabetes doesn't cause heart failure directly, but it promotes coronary artery disease and hypertension, especially in women. A 1993 report from the Framingham Heart Study indicated that diabetic women, ages 35 to 64, were twice as likely to develop heart failure as diabetic men the same age.

Valvular abnormalities. Heart valves that have structural defects, whether present at birth or resulting from disease, may fail to open and close properly. As with hypertension, the heart may pump harder to compensate; over time, this can result in heart failure.

Myocardial damage. With age, the heart finds it more difficult to compensate for past damage to its muscle tissue. This damage may result from conditions present at birth (such as congenital cardiomyopathy or abnormalities in the formation of the heart chambers) or it may be due to infections or other conditions encountered in youth or adulthood. A heart attack, for example, can permanently damage the heart muscle. About one-quarter of people who survive a heart attack develop heart failure within the next year.

Severe lung disease. Conditions like chronic obstructive pulmonary disease and pulmonary fibrosis reduce the amount of oxygen in the blood, forcing the heart to work harder. Eventually, the right side of the heart can weaken and become enlarged, a usually fatal condition known as cor pulmonale.

Obesity. Probably because it raises the risk of CAD, obesity is also an independent risk factor for heart failure. In the Framingham study, obese women had a 50% greater risk of heart failure than women of normal weight.

Certain forms of chemotherapy. The chemotherapy drugs known as anthracyclines—for example, doxorubicin (Adriamycin), which is used to treat breast and other forms of cancer—are toxic to the myocardium. Cancer survivors who were treated with these drugs have an elevated risk for heart failure.

Peripartum cardiomyopathy. Rarely, for unexplained reasons, women suffer heart failure in the month before giving birth or within a few months afterward. The condition can be reversed if it is treated promptly, but it is likely to recur in future pregnancies. A woman is at greater risk of this condition if she's over age 35, is African American, or has pregnancy-related diabetes.

Sleep apnea. Sleep apnea (pauses in breathing during sleep) is common in people with heart failure, although its precise role in the development or course of the disease isn't known. A 2005 study in the New England Journal of Medicine showed that resolving sleep apnea didn't improve survival in heart failure patients who had the disorder.

Symptoms of heart failure
Heart failure usually develops gradually, so its signs are much less dramatic than those of heart attack, and it may go unidentified and untreated until it reaches an advanced stage. The most common symptoms—often confused with the flu or other conditions—include these:

Fatigue. Muscles that don’t get enough oxygen tire easily. People with early heart failure may notice that they’re less able to exercise. As the condition progresses, even simple tasks like doing dishes or getting dressed may be exhausting.

Edema. As the heart’s pumping ability declines, lymph fluid seeps from vessels laden with back-up blood and accumulates in the lungs and other body tissues. The effects are most noticeable in the feet and ankles, where blood pools because the heart can no longer overcome the pull of gravity. The abdomen may also become distended with fluid. These symptoms are so common in heart failure that it was once known as “congestive heart failure.” That term isn't used much any more because physicians recognize that heart failure may occur without lung congestion and swelling.

Shortness of breath. As fluid builds up in the lungs, it becomes harder to breathe, especially while lying down.

Persistent cough. Again, fluid in the lungs is responsible. The cough is likely to be worse when lying down and may produce frothy, blood-tinged mucus.

Rapid heart rate. Heart palpitations may occur as the heart pumps faster in an effort to compensate for its weakened contractions.

Loss of appetite. Because the digestive system isn’t receiving sufficient blood, a person with heart failure tends to feel nauseous or deceptively full.
Diagnosing heart failure

Diagnosing heart failure is, to some extent, a subjective judgment, but your clinician will make the diagnosis only after a number of tests. She or he is likely to begin with a thorough physical, taking your blood pressure and heart rate, listening to your heart for signs of valve damage, and checking your lungs for sounds of congestion. Your feet and abdomen will also be examined for evidence of swelling. Your blood will be tested for anemia and for abnormal blood levels of various salts and proteins, which may indicate stress on the liver or kidneys.

You’ll probably be given an electrocardiogram, which measures and records the electrical signals that trigger heartbeats; an echocardiogram (ultrasound), which visualizes the heart as it beats (see illustration); or a stress test in which radioactive dye is injected into an artery and x-ray monitoring reveals how it permeates the heart during exercise. Individually and together, these tests can indicate how the heart is functioning.

Treating heart failure

There’s no cure for heart failure, but its symptoms can be relieved, and its progress slowed. One goal is to prevent acute episodes in which symptoms worsen dramatically and hospitalization is required. Many drugs have been developed to strengthen the heart’s contractions, reduce blood pressure, regulate the heartbeat, and remove fluid from the body. Although women comprise less than 25% of subjects enrolled in clinical trials studying heart failure, the available data indicate that these drugs are effective for both sexes.

Most people diagnosed with heart failure take several drugs—often the same ones used to treat hypertension. The regimen is likely to include an angiotensin-converting-enzyme (ACE) inhibitor or an angiotensin-receptor blocker to relax blood vessels and reduce water and salt retention; a beta blocker to slow the heart rate; and a diuretic to eliminate excess fluid. Sometimes another vasodilator (an ACE inhibitor is also a vasodilator) is added to widen the blood vessels and improve blood flow. People with valve disease may also take an anticoagulant to prevent blood clots.

One drug used to improve the heart’s contractions is digoxin, a version of digitalis, a drug so old that it predates the FDA requirement for clinical trials to demonstrate effectiveness. Unlike ACE inhibitors and beta blockers, digoxin hasn’t been shown to increase life span. In the federally sponsored Digitalis Investigation Group trial, the only controlled clinical study of digoxin, it slightly increased survival time for men but slightly increased the risk of dying for women. Digoxin does reduce the need for hospitalization, but it has been associated with a higher rate of irregular heartbeats (arrhythmias), and women seem to be more sensitive to its side effects than men. Women taking digoxin should have their blood levels monitored closely to reduce the likelihood of problems.

Living with heart failure

Today, people with heart failure are living longer and more comfortably. Therapeutic advances have played a large role, but they aren’t the only answer. If you have heart failure, here are some ways you can improve your quality of life:

Reduce risk factors. It’s never too late to eliminate the factors that may have contributed to heart failure. Stop smoking. Lose weight. Be physically active. Avoid salt, saturated fat, trans fat, and cholesterol. Stay away from alcohol.

Take your medication. Never change your dose or quit taking a medication without consulting your clinician, even if you’re feeling better.

Weigh yourself daily. If you suddenly gain a few pounds, you may have increased fluid buildup that demands immediate attention.

Monitor yourself carefully. Some patients keep a daily log to record their weight and evaluate key symptoms—breathlessness, fatigue, and swelling—on a one-to-five scale. See your physician at the first sign of a new or worsening symptom. Many people with heart failure die because they wait too long to seek help.
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